

**AMENDMENTS IN THE CLAIMS:**

1. (Currently amended) A data recording method for recording data as edge position information, including marks and spaces of multiple different lengths, on a storage medium by irradiating the storage medium with a pulsed energy beam, the method comprising ~~the steps of~~:

(A) generating an NRZI data based on the data to be recorded;

(B) determining a write pulse waveform, defining the power modulation of the energy beam, according to the code lengths x of respective codes included in the NRZI data, the code lengths x (where x is an integer equal to or greater than one) corresponding to mark lengths of xTw (where Tw is a detection window width); and

(C) modulating the power of the energy beam based on the write pulse waveform,

wherein if the shortest code length of the NRZI data is n (~~which where~~ n is an integer equal to or greater than one), the step (B) includes assigning a write pulse waveform that has only one write pulse Pw to recording mark making periods corresponding to codes with code lengths x of n, and n+1 and n+2, and a write pulse waveform that has multiple write pulses Pw to recording mark making periods corresponding to codes with code lengths x of ~~n+3~~ n+2 or more, respectively,

wherein the start position of the first pulse that is included in a recording mark making period of the write pulse waveform is shifted according to the length x of a code associated with the recording mark making period, and

the write pulse waveform in the recording mark making period corresponding to codes with code lengths x of n+2 or more includes write pulses, of which the number is equal to the quotient obtained by dividing x by two.

2-9. (Canceled)

10. (Currently amended) An apparatus for recording data as edge position information, including marks and spaces of multiple different lengths, on a storage medium by irradiating the storage medium with a pulsed energy beam, the apparatus comprising:

laser driving means for modulating the power of the energy beam;

coding means for converting the data to be recorded on the storage medium into an NRZI data; and

mark length classifying means for determining a write pulse waveform, defining the power modulation of the energy beam, according to the code lengths  $x$  of respective codes included in the NRZI data, the code lengths  $x$  (where  $x$  is an integer equal to or greater than one) corresponding to mark lengths of  $xT_w$  (where  $T_w$  is a detection window width),

wherein if the shortest code length of the NRZI data is  $n$  (which where  $n$  is an integer equal to or greater than one), the mark length classifying means assigns a write pulse waveform that has only one write pulse  $P_w$  to recording mark making periods corresponding to codes with code lengths  $x$  of  $n$ , and  $n+1$  and  $n+2$ , and a write pulse waveform that has multiple write pulses  $P_w$  to recording mark making periods corresponding to codes with code lengths  $x$  of  $n+3$   $n+2$  or more, respectively,

wherein the write pulse waveform in the recording mark making period corresponding to codes with code lengths  $x$  of  $n+2$  or more includes write pulses, of which the number is equal to the quotient obtained by dividing  $x$  by two, and

further comprising pulse shifting means for shifting the start position of the first pulse that is included in a recording mark making period of the write pulse waveform according to the length x of a code associated with the recording mark making period.

11-17. (Canceled)

18. (New) A storage medium comprising a recording region for recording data as edge position information, including marks and spaces of multiple different lengths, on a storage medium by being irradiated with a pulsed energy beam,

wherein a power modulation of the energy beam is defined by a write pulse waveform, according to the code lengths of respective codes included in an NRZI data that is generated based on data to be recorded, the code lengths x (where x is an integer equal to or greater than one) corresponding to a mark length  $xT_w$  (where  $T_w$  is a detection window width); and

wherein if the shortest code length of the NRZI data is n (where n is an integer equal to or greater than one), each write pulse waveform for code lengths x of n and  $n+1$  has only one write pulse, and each write pulse waveform for code lengths x of  $n+2$  or more has multiple write pulses,

wherein the start position of the first pulse that is included in a recording mark making period of the write pulse waveform is shifted according to the length x of a code associated with the recording mark making period, and

the write pulse waveform in the recording mark making period corresponding to codes with code lengths x of  $n+2$  or

more includes write pulses, of which the number is equal to the quotient obtained by dividing  $x$  by two.

19. (New) A data reproduction method for reproducing data recorded on the storage medium according to claim 18, the method comprising:

reproducing the date recorded on the recording region of the storage medium by irradiating the storage medium with the pulse energy beam.